CLAIMS

What is Claimed is:

1. A control system for controlling a hydronic system having both a heating source capable of heating water to be delivered over a piping line to a plurality of heat exchangers and a cooling source capable of cooling water to be delivered over the same piping line to the plurality of heat exchangers, said control system comprising:

a plurality of zone controllers, each zone controller connected to a respective heat exchanger so as to control the delivery of water over the piping line to the respective heat exchanger, each zone controller being operative to generate a demand for either heated water, cooled water or no water;

a hydronic system controller in communication with each of said zone controllers, said hydronic system controller being operative to periodically receive each zone controller's demand for either heated water, cooled water or no water, said hydronic system controller being furthermore operative to periodically determine whether there is a predominance of heating or cooling demands being received from said zone controllers, said hydronic system controller being still furthermore operative to normally activate either the heating source within the hydronic system when there is a predominance of heating demands received from said zone controllers or activate the cooling source within the hydronic system when there is a predominance of cooling demands received from said zone controllers.

2. The control system of claim 1 further comprising:

a temperature sensor for sensing the temperature of the circulating water at a given location in the piping of the hydronic system; and

wherein said hydronic system controller is operative to activate the heating or cooling source only if the sensed temperature of the circulating water is within a predefined temperature range.

3. The control system of claim 1 wherein the location of said temperature sensor is in the return water line piping which returns the water to the heating or cooling source to be activated.

4. The control system of claim 1 wherein said hydronic system controller is furthermore operative to deactivate the currently active heating source or the currently active cooling source in response to having received a predominance of demands from the zone controllers requesting that the currently inactive heating source or currently inactive cooling source be activated said hydronic system control being furthermore operative to activate the currently inactive heating or cooling source in the event that a predetermined period of time has elapsed.

5. The control system of claim 4 further comprising:

a temperature sensor for sensing the temperature of the circulating water at a given location in the piping of the hydronic system; and

wherein said hydronic system controller is operative to activate the currently inactive heating or cooling source in the event that the sensed temperature of the circulating water is within a predefined temperature range before the predetermined period of time has elapsed.

6. The control system of claim 5 wherein the location of said temperature sensor is in the return water line piping which returns the water to the inactive heating or cooling source to be activated.

7. The control system of claim 4 wherein said hydronic system controller is furthermore operative to only deactivate the currently active heating or

the currently active cooling source in the event that a predetermined run time has elapsed for the currently active heating or the currently active cooling source.

8. The control system of claim 4 wherein said hydronic system controller is operative to periodically determine whether all zone controllers are demanding no conditioned water, said hydronic system controller being operative to thereafter maintain the active state of the currently active heating or cooling source and to furthermore transmit a message to the zone controllers indicating that the currently active heating or cooling source will continue to provide water over the pipe line to the heat exchangers controlled by the zone controllers.

9. The control system of claim 1 wherein said hydronic system controller is operative to send a message to each of the zone controllers indicating whether heated water or cooled water is to be provided to the heat exchangers and wherein each of said zone controllers is operative to control the delivery of water to the respective heat exchanger controlled by said zone controller depending on whether the zone controller's demand is for heated water, cooled water or no water.

10. A process for controlling the provision of conditioned water over a common piping line to a plurality of heat exchangers, under the control of zone controllers, said process comprising the steps of:

periodically polling the plurality of zone controllers for the heat exchangers to obtain the demands for heated water, cooled water or no conditioned water from the zone controllers;

providing heated water to the heat exchangers in response to the polling results indicating a predominance of demands for heated water and providing cooled water to the heat exchangers in response to the polling results indicating a predominance of demands for cooled water; and

switching from providing heated water to providing cooled water to the heat exchangers in response to the polling results continually indicating a predominance of demands for cooled water over a predetermined period of time and switching from providing cooled water to providing heated water to the heat exchanger in response to the polling results continually indicating a predominance of demands for heated water over a predetermined period of time.

11. The process of claim 10 further comprising:

switching to providing cooled water before the predetermined period of time has elapsed in the event that the water at a particular location in the return water piping is within a predefined range of temperatures; and

switching to providing heated water before the predetermined period of time has elapsed in the event that the water at a particular location in the return water piping is within a predefined range of temperatures.

12. The process of claim 10 further comprising the steps of:

initiating a tracking of the predetermined period of time that must elapse before the switching to either providing cooled water or the switching to providing heated water; and

delaying said step of initiating the tracking of the predetermined period of time that must elapse before the switching in the event that a second predetermined period of time has not elapsed since the current provision of heated or cooled water to the heat exchanger was initiated.

13. The process of claim 10 wherein said step of providing heated water comprises activating a heating source and wherein said step of providing cooled water comprises activating a cooling source and wherein said step of switching from providing heated water to providing cooled water to the heat exchangers comprises deactivating the cooling source and thereafter activating the heating source after the

predetermined period of time has elapsed and wherein said step of switching from providing cooled water to providing heated water comprises deactivating the heating source and thereafter activating the cooling source after the predetermined period of time has elapsed.

14. The process of claim 13 wherein said step of switching from providing cooled water to providing heated water furthermore comprises switching the position of a valve upstream of the common piping line so as to cause the delivery of the heated water upon activating the cooling source and wherein said step of switching from providing cooled water to providing heated water comprises switching the position of the valve upstream of the common piping line so as to cause delivery of the heated water upon activating the heating source.